

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Serial No. : 10/806,643
Inventor(s) : Jeffrey J. Schroeder, *et al.*
Filing Date : March 23, 2004
Title : FOAM BARRIER HEAT SHIELD

Conf. No. : 2569
TC/AU : 1771
Examiner : Hai Vo

Customer No. : 000116
Docket No. : INTF 35691US1

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF AND
REQUEST FOR EXTENSION OF TIME

Dear Sir:

Appellants respectfully submit this Appeal Brief under 37 CFR §41.37 in connection with the appeal filed in the application identified above on August 7, 2007. The original period for submitting the Appeal Brief expired on October 7, 2007, and thus, appellants hereby request that this period be extended one month, up to and including November 7, 2007.

Please charge the fee for filing the appeal brief required by 37 CFR §41.20(b)(2) in the amount of \$255.00 for a small entity, along with the fee under 37 CFR §1.17(a)(1) in the amount of \$60.00 for a one-month extension of time to submit this Appeal Brief to Deposit Account No. 16-0820, Order No. INTF 35691US1. The Commissioner is also authorized to charge any additional fees due in connection with the present appeal, and credit any overpayments to Deposit Account No. 16-0820, Order No. INTF 35691US1.

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Real Party in Interest: (37 CFR §41.37(c)(1)(i))

The real party in interest is Intellectual Property Holdings, LLC, which is the assignee of the entire right, title and interest in the subject application.

Related Appeals and Interferences: (37 CFR 41.37(c)(1)(ii))

The claims at issue in the present appeal were also the subject of a prior appeal, which was resolved before reaching the Board by a Pre-Appeal Conference requested by appellants on August 8, 2006. The Pre-Appeal Conference resulted in withdrawal of the claim rejections based U.S. Patent No. 4,525,406 to Pollock (hereinafter “Pollock”), and the reopening of prosecution.

The pending claims have been rejected twice since prosecution was reopened based on newly-cited art that does not include Pollock. Hence, appellants and appellants’ legal representatives believe that the prior appeal would not directly affect, be directly affected by or have a bearing on the Board’s decision in this appeal.

Appellants also requested a Pre-Appeal Conference to resolve the outstanding claim rejections at the heart of this appeal. The Pre-Appeal Conference resulted in a decision to allow the present appeal to proceed to the Board.

Neither Appellants nor Appellants’ legal representatives in this matter know of any other prior or pending appeals, interferences or judicial proceedings that are related to or would directly affect, be directly affected by or have a bearing on the Board’s decision in this appeal.

Status of Claims: (37 CFR 41.37(c)(1)(iii))

The following is the status of the claims in the case:

Claims rejected: 2, 3, 5, 7, 10-12, 15-23, 33, 35, 39-42, 44, 45 and 47-49

Claims cancelled: 1, 4, 6, 8, 9, 13, 14, 24-32, 34, 36-38, 43 and 46

The claims being appealed are all the rejected claims, i.e., claims 2, 3, 5, 7, 10-12, 15-23, 33, 35, 39-42, 44, 45 and 47-49, however, none of the dependent claims in the present application are argued separately from independent claim 47.

Claim 47 is the only independent claim in the present application, and thus, should claim 47 be found allowable, the remaining claims are also allowable for the limitations therein, and for the limitations of the claims from which they depend.

Status of Amendments: (37 CFR 41.37(c)(1)(iv))

A response dated July 16, 2007 was filed by appellants pursuant to 37 CFR §1.116 subsequent to the issuance of the final Office action. The after-final response filed by appellants included amendments to respond to certain formality rejections based on 35 USC §112, second paragraph, to remove those rejections as issues on appeal. Appellants' amendments in their after-final response were entered for purposes of this appeal by the Examiner in an Advisory Action dated July 20, 2007. A copy of the claims as they currently stand is provided in the Claims Appendix of this Appeal Brief.

Summary of Claimed Subject Matter: (37 CFR 41.37(c)(1)(v))

Set forth below is a concise explanation of claim 47, which is the only independent claim involved in this appeal. None of the dependent claims are argued separately, and thus, a concise explanation of those claims is not provided herein. References below to the specification are made to the paragraph and lines of the

specification that are involved, as those paragraph and line numbers appear in appellants originally-filed specification.

None of the claims at issue in this appeal are means-plus-function claims permitted by 35 USC §112, sixth paragraph.

Claim 47:

As indicated above, claim 47 is the only independent claim in the present application. Claim 47 calls for a combination comprising an automobile body panel having a heat shield fastened or mounted to the body panel. *Paragraph [0011], lines 1-3; paragraph [0049], lines 1-11.* Thus, both the body panel and the heat shield coupled thereto are required to be taught by the art of record to support a rejection of claim 1 under 35 USC §§102 and 103. The heat shield includes both a first metallic outer layer 12 (Figure 3), a second metallic outer layer 22 (Figure 3), and a foam layer disposed in between the first and second metallic outer layers 12, 22. *Paragraph [0021], lines 1-3; Figure 3.* The heat shield, alone, and without requiring any structure from the body panel, includes at least two separate metallic outer layers that sandwich the foam layer therebetween. *Paragraph [0021], lines 1-3; Figure 3.* This assembly is then fastened or mounted to the body panel to insulate it from excessive temperatures. *Paragraph [0049], lines 1-11.*

The metallic outer layers in claim 47 are used in the present application consistent with the ordinary meaning of those terms. Each metallic outer layer is described as being made of a metallic material capable of withstanding the temperatures to which the heat shield will be exposed, typically up to about 1250°F. *Paragraph [0022], lines 2-4.* Several metallic materials from which the metallic outer layers can be made are given as examples. *Paragraph [0022], lines 4-13.*

The foam layer between the metallic outer layers is described in the written description as being deformable to accommodate a particular shape and contour to which the heat shield is to be bent and to generally conform in use without substantially damaging the cellular structure of the foam as a result of such deformation. *Paragraph [0024], lines 1-5.* Such a foam is described as including limited viscoelastic properties, allowing it to deform and conform to the contour of the body panel to which the heat

shield is coupled, without appreciably or substantially damaging the foam's cellular structure upon said deformation. *Paragraph [0024], lines 1-5.* And to make it suitable for use as a heat shield and as a sound damper, the foam layer is also effective to withstand temperatures of at least 1000°F, and to dampen acoustic tonal frequencies below 2000 Hz. *Paragraph [0023], lines 1-4.*

In general, the combination of claim 47 includes both a heat shield, with its two outer metallic layers and a thermally-insulating foam layer sandwiched there between, along with the body panel to which the heat shield is to be coupled.

Grounds of Rejection to be Reviewed on Appeal (37 CFR §41.37(c)(1)(vi))

1. Whether claim 47 is anticipated under 35 USC §102(b), or in the alternative, rendered unpatentable under 35 USC §103(a) by U.S. Patent No. 6,302,466 to Zwick (hereinafter “Zwick”).

2. Whether claim 47 is anticipated under 35 USC §102(b), or in the alternative, rendered unpatentable under 35 USC §103(a) by International Patent Application Publication No. WO 90/14944 to Ragland *et al.* (hereinafter “Ragland”).

3. Whether claim 47 is unpatentable under 35 USC §103(a) as being obvious over U.S. Patent No. 6,955,845 to Poole *et al.* (hereinafter “Poole”) in view of Ragland.

Argument (37 CFR §41.37 (c)(1)(vii))

I. Claim 47, and accordingly, all claims depending there from are not anticipated or rendered obvious by Zwick.

Appellants submit that Zwick fails to teach all of the limitations of independent claim 47 as required to sustain a rejection under 35 USC §§102 and 103, and thus, Zwick does not anticipate that claim, nor render that claim obvious.

Specifically, Zwick is silent with regard to cellular structure of the foam other than to suggest, as background information, that open-cell materials offer enhanced sound-dampening properties. *See, e.g.*, Zwick, Col. 1, Lines 50-54. Zwick makes no other reference to any properties of the foam, to the deformation characteristics of the foam, or to the method of forming such a foam that has the claimed physical response to being deformed. Thus, Zwick fails to teach that the foam layer is “deformable to accommodate a particular shape and contour to which the heat shield is to be bent and to generally conform in use without substantially damaging the cellular structure of the foam as a result of such deformation,” as claimed in independent claim 47.

Zwick also fails to teach or suggest that the foam is “effective to withstand operative heat shield temperatures of at least 1000°F, and to dampen acoustic tonal frequencies below 2000 Hz,” as claimed in independent claim 47. Zwick is silent regarding the physical dimensions of the foam employed, the type of material from which the foam is formed, the method of forming such a foam to provide it with the claimed property, or any other qualitative or quantitative description of the foam at all. In fact, the Zwick patent merely mentions that a porous foam can be used as the thermally and acoustically insulating insulation instead of the stacked, perforated aluminum foils described in Zwick. Accordingly, Zwick does not teach the thermal and acoustic insulating properties claimed in claim 47.

The Examiner, in rejecting appellants’ arguments regarding Zwick in the final Office action, explains that since Zwick discloses the resilient insulating layer having a superior vibration-damping and heat resistance effect, the claimed ranges of thermal and acoustic insulation properties are inherently taught by Zwick. However, the ranges of thermal and acoustic insulation properties claimed in claim 47 do not necessarily flow

from the teachings of Zwick, and Zwick offers no explanation of how to form a foam having the claimed properties.

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (internal citations omitted).

With so much information concerning the properties of the "porous foam" in Zwick left unsaid, it can not be determined that the claimed thermal and acoustic insulation properties *necessarily* flow from Zwick as required to support an inherent teaching of those properties. To find otherwise would amount to an assertion that all porous foams mentioned in any written description, without more, necessarily include the properties claimed in claim 47.

For at least the above reasons, Zwick neither anticipates independent claim 47, nor renders independent claim 47 obvious.

II. Claim 47, and accordingly, all claims depending there from are not anticipated or rendered obvious by Ragland.

Claim 47 also has been rejected under 35 USC § 102(b)/103(a) as being anticipated, or rendered obvious by Ragland. As set forth in more detail below, Ragland fails to teach or suggest every limitation of claim 47, making a rejection under 35 USC §102(b) or 35 USC §103(a) improper.

The Examiner correctly acknowledges at page 5, lines 3-7 of the final Office action that Ragland does not disclose the deformability limitation of the foam as-claimed in independent claim 47. But then, the Examiner incorrectly contends as follows:

Therefore, it *is not seen that the foam could not have been deformable* to accommodate [sic] a particular shape and contour to which the heat shield laminate is to [be] bent and to generally conform in use without substantially damaging the cellular structure of the foam as the laminates of Ragland and the present invention are directed to similar products which serve the same purposes, namely heat shielding automotive body panel. The same token is applied to the thermal resistance and sound absorbency of the foam. Accordingly, Ragland anticipates or strongly suggests the claimed subject matter.

Final Office action, Page 5, Lines 13-20 (emphasis added).

The Examiner's line of reasoning is understood by appellants to stand for the proposition that Ragland teaches every limitation concerning a foam not expressly excluded in its written description. In other words, since the Ragland reference discloses a foam and fails to exclude the possibility that the foam therein can "generally conform in use without substantially damaging the cellular structure of the foam as a result of such deformation," or is "effective to withstand operative heat shield temperatures of at least 1000°F, and to dampen acoustic tonal frequencies below 2000 Hz," as claimed in claim 47, then those limitations are inherently present in Ragland. However, such reasoning is clearly improper, and without precedential support. As stated above, for a teaching to be inherently present in a cited reference it is not sufficient that the teaching may possibly result from a given set of circumstances. *In re Robertson*, 169 F.3d at 745, 49 USPQ2d at 1950-51 (internal citations omitted).

As noted by the Examiner, Ragland discloses an embodiment that includes a metal – foam – metal arrangement of layers, and that such an arrangement appears to be fastenable to an automobile. However, Ragland is silent with regard to the thermal and acoustical insulation thresholds of the laminate claimed in independent claim 47 of the present application.

An embodiment of the laminate disclosed in Ragland is produced in a manner that calls for it to be collected on a roll, but Ragland clearly explains that such an embodiment includes a non-woven *fiber* mat as the insulation, not a *foam* layer. This exemplary

embodiment utilizes a non-woven *fiber* mat as the insulation layer because such mats are known to be flexible, and therefore conducive to being produced and collected on a roll as disclosed therein. There is no indication in Ragland that embodiments including a *foam* layer as the insulation layer are similarly rolled. Thus, Ragland may disclose an embodiment including a metal – foam – metal arrangement of layers, the fastening of the heat shield to an automobile, and the cutting of the laminate therein into various shapes. *But none of this has anything to do with, or suggests commonality between, the respective deformability characteristics associated with Ragland's heat shield and the heat shield that is claimed.* That two foams are sandwiched between metal layers, have similar thicknesses, and are both intended for damping applications, certainly does not suggest that they must have the same, or even similar, deformability characteristics. Nor does it suggest that they must have the same, or even similar, temperature resistance or vibration damping properties. It certainly does not suggest that they must have the same combination of all three of these characteristics. Ragland also fails to give any indication that the disclosed heat shield is to be pressed against a contoured body panel so as to conform to that contour.

But even assuming, *en arguendo*, that the foam insulation is rolled as described in the illustrative embodiment described in Ragland, there is still no teaching or any suggestion of the behavior exhibited by the cell structure of the foam when the laminate is so rolled. Accordingly, it is not clear whether the foam therein includes viscoelastic, non-viscoelastic, limited viscoelastic, or any type of foam behavioral properties such as those claimed in independent claim 47.

In sum, the fact that Ragland discloses two foams sandwiched between metal layers and intended for damping applications, does not teach or suggest that they must have the same, or even similar, deformability characteristics. Nor does it teach or suggest that they must have the same, or even similar, temperature resistance or vibration damping properties. It certainly does not teach or suggest that they must have the same combination of all three of these characteristics. Ragland also gives no indication that the disclosed heat shield is to be pressed against a contoured body panel so as to conform to that contour.

For at least the above reasons, appellants respectfully submit that the rejection of claim 47 based on Ragland is improper, and should be withdrawn.

III. Claim 47, and accordingly, all claims depending there from are not rendered obvious by Poole in view of Ragland.

Claim 47 has also been rejected under 35 USC §103(a) as being unpatentable over Poole in view of Ragland. For reasons analogous to those set forth above, the combination of Poole and Ragland fails to teach or suggest every limitation of claim 47. And as set forth in more detail below, there is insufficient motivation to justify the combination of references as required to support a rejection of claim 47 under 35 USC §103(a).

More specifically, neither reference teaches a foam layer that is “deformable to accommodate a particular shape and contour to which the heat shield is to be bent and to generally conform in use without substantially damaging the cellular structure of the foam as a result of such deformation,” or that the foam layer is “effective to withstand operative heat shield temperatures of at least 1000°F, and to dampen acoustic tonal frequencies below 2000 Hz.” The remarks above regarding these shortcomings of Ragland addressing the rejection of claim 47 in view of Ragland alone are equally applicable here, and the Examiner herself agrees that Poole does not satisfy these limitations of claim 47.

The correct application of 35 USC 103(a) is set forth in *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 86 S. Ct. 684, 15 L. Ed. 2d 545 (1966) where the Court set out a framework for applying the statutory language of 35 USC 103. The analysis is objective and is stated as follows:

Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. *Id.*, at 17-18, 86 S. Ct. 684, 15 L. Ed. 2d 545.

One of the differences between the prior art and the claims at issue is pointed out by the Examiner in the final Office action leading to this appeal. It is correctly noted in the final Office action that Poole does not disclose the foam insulating layer, but instead teaches the use of a polymer based blanket as the insulator layer. Final Office action, Page 8, Lines 13-19. Ragland, on the other hand, is cited as teaching the foam insulator layer, including the deformation, thermal and acoustical properties recited in claim 47. However, for reasons set forth in detail above with regard to the rejection of claim 47 in view of Ragland alone, Ragland fails to teach or suggest the claimed deformation characteristics of the foam layer, and accordingly, that the foam layer is “deformable to accommodate a particular shape and contour to which the heat shield is to be bent and to generally conform in use without substantially damaging the cellular structure of the foam as a result of such deformation.” Additionally, Ragland also fails to inherently teach or suggest that the foam layer is “effective to withstand operative heat shield temperatures of at least 1000°F, and to dampen acoustic tonal frequencies below 2000 Hz.”

Further, there is also insufficient motivation to justify the combination of those references. In assessing the obviousness or nonobviousness of the claims in the present application against the background of the prior art as required by *Graham*, the conflicting teachings between the cited references and the claimed subject matter must be considered. A claim is not rendered obvious if “the prior art teaches away from the claimed invention in any material respect,” *In re Sullivan*, 498 F.3d 1345, 1351, (Fed. Cir. 2007) (quoting *In re Peterson*, 315 F.3d 1325, 1331 (Fed. Cir. 2003)).

Claim 47 claims that the foam layer is “effective to withstand operative heat shield temperatures of at least 1000°F, and to dampen acoustic tonal frequencies below 2000 Hz.” As explained above, Ragland fails to teach or suggest the thermal characteristics including that the foam layer can withstand operative heat shield temperatures of at least 1000°F. Poole, in contrast, includes an insulation insert that is added to the polymer based blanket forming the insulation layer when added thermal insulation is required. Poole goes on to explain that “[f]or many applications, strong thermal insulating properties are an essential characteristic of the insert 16. For these applications, the material utilized for the insert 16 must not produce smoke when exposed

to temperatures as high as 450°F.” Poole, Col. 5, Lines 21-25. From this it is clear that the thermal insulator of Poole is a low-temperature insulator, designed for environments where the maximum temperature does not exceed 450°F. Thus, even assuming, *en arguendo*, that the foam material of Ragland can withstand operative heat shield temperatures of at least 1000°F as claimed in claim 47, one would not be motivated to combine such a foam layer with the teachings of Poole because other components forming the insulator in Poole would fail at temperatures above 450°F.

In addition to the failure of Poole in view of Ragland to teach every claimed feature in claim 47, there is insufficient motivation to justify their combination as required to support a *prima facie* rejection under 35 USC §103(a). For at least the above reasons, appellants respectfully submit that the rejection of claim 47 under 35 USC §103(a) as being unpatentable over Poole in view of Ragland is improper.

Conclusion

For at least the reasons set forth above, appellants respectfully submit that appellants' claims represent a new, useful and nonobvious device for insulating a body panel from high temperatures. Accordingly, appellants respectfully request the Board of Patent Appeals and Interferences to reverse the rejection of claims 2, 3, 5, 7, 10-12, 15-23, 33, 35, 39-42, 44, 45 and 47-49 and return the case to the Examiner for issuance of a notice of allowability.

Respectfully submitted,
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Claims Appendix (37 CFR 41.37(c)(1)(viii))

1. (canceled)
2. A combination according to claim 47, said first and second metallic outer layers having substantially the same thickness.
3. A combination according to claim 47, said first and second metallic outer layers being made from the same metal or metal alloy.
4. (canceled)
5. A combination according to claim 47, said foam layer comprising polyurethane foam.
6. (canceled)
7. A combination according to claim 47, said foam layer comprising a semi-rigid foam.
- 8-9. (canceled)

10. A combination according to claim 47, said foam layer comprising a semi-rigid foam that is reversibly deflectable from the force of an impacting acoustical wave to a sufficient extent to absorb or redirect a portion of the wave's acoustical energy.

11. A combination according to claim 10, said foam being at least 95 percent recoverable from an acoustical deflection.

12. A combination according to claim 47, said foam layer having a thickness of 0.005-0.75 inches.

13-14. (canceled)

15. A combination according to claim 47, further comprising a porous material layer embedded within said foam layer.

16. A combination according to claim 15, said porous material layer being a fiber mat being made from non-woven fibers.

17. A combination according to claim 16, said fibers in said porous material layer being polypropylene fibers.

18. A combination according to claim 15, said porous material layer being spaced substantially equidistant from the first and second metallic outer layers, and having a thickness of about 2-2.5 mm.

19. A combination according to claim 47, further comprising an absorber layer comprising fluffy fibers laminated to the second metallic outer layer opposite the foam layer, said absorber layer having a thickness of at least about 1/4 inch.

20. A combination according to claim 19, said absorber layer comprising polyester fluffy fibers, polyethylene fluffy fibers, or a mixture thereof.

21. A combination according to claim 47, said foam layer being made from an expandable foaming composition comprising 10-40 weight percent of a first polyol, 20-50 weight percent of a second polyol, 5-20 weight percent isocyanate excluding the weight of the molecule(s) to which the isocyanate groups are attached, 0-0.5 weight percent tin catalyst, 0.2-2 weight percent amine catalyst, 0-2.5 weight percent surfactant, and 0.1-5 weight percent foaming agent, wherein the first polyol has a molecular weight of 200-600 and a hydroxyl number of 200-600, and the second polyol has a molecular weight of 2000-8000 and a hydroxyl number of 10-200.

22. A combination according to claim 21, said first and second polyols being sucrose-based and glycerin-based polyols respectively.

23. A combination according to claim 21, said isocyanate being provided in the form of an allophanate-modified diphenylmethanediisocyanate.

24-32. (canceled)

33. A combination according to claim 47, having an area density less than 0.35 lb/ft².

34. (canceled)

35. A combination according to claim 47, said heat shield being internally damped against vibration.

36-38. (canceled)

39. A combination according to claim 47, said foam layer being effective to dampen acoustic tonal frequencies below 250 Hz.

40. A combination according to claim 19, said fibrous absorber layer having a thickness of not more than about 1/2 inch.

41. A combination according to claim 19, said foam layer being deformable to accommodate a particular shape and contour to which the heat shield is to be bent and to

generally conform in use, without substantially damaging the cellular structure of the foam as a result of such deformation.

42. A combination according to claim 47, said foam layer comprising a substantially rigid polyurethane foam that is sufficiently pliant to be bent to and accommodate a particular shape and contour to which the heat shield is to be bent and to generally conform in use, without substantially damaging the cellular structure of the foam as a result of such bending, said polyurethane foam being reversibly deflectable from the force of an impacting acoustical wave to a sufficient extent to absorb or redirect a portion of the wave's acoustical energy.

43. (canceled)

44. A combination according to claim 47, said foam layer having a thickness of 0.15-0.17 inches.

45. A combination according to claim 47, said foam layer being made as an expanded foam layer between the first and second metallic outer layers, such that the foam layer is adhesively bonded to adjacent surfaces of the respective first and second metallic outer layers without a separate adhesive or adhesive layer.

46. (canceled)

47. A combination comprising an automobile body panel having a heat shield fastened or mounted to said body panel, said heat shield comprising a first metallic outer layer, a second metallic outer layer, and a foam layer disposed in between said first and second metallic outer layers, said foam layer being deformable to accommodate a particular shape and contour to which the heat shield is to be bent and to generally conform in use without substantially damaging the cellular structure of the foam as a result of such deformation, said foam layer being effective to withstand operative heat shield temperatures of at least 1000°F, and to dampen acoustic tonal frequencies below 2000 Hz.

48. A combination according to claim 47, said foam being reversibly deflectable from the force of an impacting acoustical wave to a sufficient extent to absorb or redirect a portion of the wave's acoustical energy.

49. A combination according to claim 47, said first metallic outer layer having a thickness of 0.001-0.02 inches.

Evidence Appendix (37 CFR 41.37(c)(1)(ix))

None

Related Proceedings Appendix (37 CFR 41.37(c)(1)(x))

None